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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/560,047	04/27/2000	Hidetsugu Fukuyama	FURUYA CASE 1380	2869

7590 03/20/2003  
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EXAMINER
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NORTON, NADINE GEORGIANNA

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 03/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/560,047

**Applicant(s)**

FUKUYAMA ET AL.

**Examiner**

Nadine Norton

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 5-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 12 and 1. 6) ☐ Other:

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## **DETAILED ACTION**

### ***Information Disclosure Statement***

The file reflects applicants' submission of a supplemental IDS on 11-8-00 in paper no.8. The 1449 and attached references are missing from the file. It is unclear if applicants' newly filed IDS (in paper nos.12 and 13) is a new IDS or a duplicate of the IDS in paper no.8.

### ***Specification***

Applicants' newly submitted abstract filed 1-9-03 is sufficient to overcome the objection to the abstract.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In dependent claim 13, applicants define a two step process. In contrast, parent claim 5 appears to be a one step process. It is unclear if applicants' claimed catalyst is used in "both" the first and second cracking step. It appears as if applicants' intend to claim the presence of the claimed catalyst in both steps. If this is the case, it is suggested that applicants' amend the claims accordingly.

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***Withdrawal of Claim Objections***

Applicants' amendments filed 1-9-03 in paper no. 14 are sufficient to overcome the previous claims objections.

***Claim Rejections - 35 USC § 102/103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 5 and 8-12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sudhakar et al. (5,624,547).

Applicants are claiming a process for hydrocracking a heavy oil. The process involves the use of a catalyst as defined in applicants' claim 1.

The reference of Sudhakar et al. (5,624,547) discloses a process including the pretreatment of a hydrocarbon oil feed before hydrocracking. See abstract and column 5, lines 52-65. Suitable feeds include whole crude oils and residua. See column 5, lines 55-56. The

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pretreatment comprises contacting the feed with a catalyst including iron (1-15%) supported on carbon. See column 9, lines 10-20 and 50-60. The carbon support has a surface area of 100-2,000 m<sup>2</sup>/g, a pore volume of 0.4-1.2 cm<sup>3</sup>/g, and an average pore diameter of 12-100 Å (1.2 to 10 nm). See column 8, lines 5-15. Process conditions include the presence of hydrogen, a temperature of 250-450 °C and a pressure of 200-3000 psig. See column 6, lines 30-45. The pretreatment accomplishes mild hydrocracking. See column 8 lines 61-64. The reference of Sudhakar et al. (5,624,547) teaches hydrocracking conditions including a temperature of 380 °C and a pressure of 1350 psig. See column 16, lines 5-25.

Sudhakar et al's pretreatment is considered to correspond to applicants' 1st hydrocracking step because the same feed (crude oil), catalyst and overlapping process conditions are employed.

It is noted that the reference is silent about the MCH conversion rate and the removal of heavy metals, nickel, vanadium, and asphaltenes. The reference is also silent about the suppression of coke formation. However, applicants' claimed MCH conversion rate, removal of contaminants, and suppression of coke would inherently occur because the same feed (crude oil) subjected to the same catalyst and conditions produces the same conversion.

Applicants' process is anticipated by the reference of Sudhakar et al.(5,624,547) because it discloses essentially the same contacting step (conditions, catalyst and feed).

Applicants' MCH conversion rate, removal of contaminants, and suppression of coke would obviously be accomplished upon operating the process of Sudhakar et al.(5,624,547).

***Claim Rejections - 35 USC § 103***

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sudhakar et al.(5,624,547).

Several differences are noted between the reference of Sudhakar et al. (5,624,547) and applicants' invention. The reference does not disclose employing applicants' claimed catalyst in more than one step. In addition, the reference is silent with respect to the concentration of catalyst in the heavy oil.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to repeat the first pretreatment step of the Sudhakar et al.(5,624,547) process until a desired level of conversion occurs because it is within the level of ordinary skill to practice a know step until a desired level of conversion is accomplished.

In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ any amount of catalyst in the first and second steps, including the specific percentages claimed by applicants, because it has been held that there is no invention where the difference in proportions are not critical and were ascertained by routine experimentation because the determination of workable ranges is not considered to be inventive. In re Swain and Adams , 70 USPQ 412 (CCPA 1946).

***Claim Rejections - 35 USC § 103***

Claims 6, 7, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sudhakar et al.(5,624,547) as applied to claims 1-5 and 8-14 above, and further in view of Simpson et al.(5,494,568) and/or and Adams et al.(3,900,390).

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See teachings of Sudhakar et al.(5,624,547) above.

It is noted that the catalyst of Sudhakar et al.(5,624,547) is not limited to iron and carbon. For instance, the Sudhakar et al. catalyst contains additional components such as sulfur, phosphorous, and a VIB metal (e.g. molybdenum).

The reference of Simpson et al.(5,494,568) is cited to illustrate that phosphorous and molybdenum are known additional promoters for hydroprocessing catalysts containing a group VIII metal such as iron. The catalysts are useful in hydroprocessing reactions such as desulfurization, denitrification, and demetallization. See column 3, lines 29-33 and 45-50, column 5, lines 35-40, and column 10, lines 16-23.

The reference of Adams et al. (3,900,390) is cited to illustrate that sulfiding is a known technique for increasing the activity of hydroprocessing catalysts. See column 7, lines 22-25.

It would have been obvious to one of ordinary skill in the art at the time the invention was made willing to accept decreased catalyst activity to employ a catalyst lacking molybdenum (a VIB metal), sulfur, or phosphorous because the references of Simpson et al.(5,494,568) and/or Adams et al. (3,900,390) illustrate that such components are known modifiers. The omission of a known catalyst component (in this case known modifiers) along with its known function (in this case increased activity) is not inventive.

Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### *Response to Arguments*

Applicants' arguments filed 1-9-03 in paper no. 14 have been fully considered but they are not persuasive.

Applicants' arguments asserting that applicants' invention distinguishes over the reference of Sudhakar et al.(5,624,574) because the reference discloses the treatment of gas oil in the examples is not persuasive. In response, it is maintained that the reference specifically discloses a suitable heavy oil feed in the form of crude oil. Applicants' response in paper no.14 (1-9-03) acknowledges that a crude oil meets applicants' heavy oil limitation (including applicants' impurities- nickel, vanadium, asphaltenes, heavy metals, etc.). As a result, the disclosure of Sudhakar et al.(5,624,574) is considered to include applicants' claimed feed. The reference's treatment of gas oil in the examples does not serve to exclude the treatment of crude oil. Since the reference specifically discloses crude oil as a suitable feed, it is considered to read on applicants' claims.

Applicants' arguments asserting that applicants' invention distinguishes over the reference of Sudhakar et al.(5,624,574) because the reference fails to disclose any problems resulting from impurities or any unexpected benefits including the prevention of coke formation, removal of heavy metals and/or nickel and/or vanadium and/or asphaltenes are not persuasive. In response, it is maintained that the applied art would similarly accomplish applicants' treatment of impurities and coke prevention because the same feed (a heavy oil in the form of a crude oil)



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is treated with a similar catalyst (a carbon supported iron catalyst) at overlapping process conditions. In addition, the reference specifically refers to impurity removal in the form of desulfurization and denitrification in column 8, lines 60-65.

Applicants' argument asserting that the claimed process distinguishes over the applied art because it employs a feed with a higher boiling point is not persuasive. In response, it is maintained that applicants' claims do not contain any limitations defining the boiling point of the feed. Applicants can not distinguish the claimed invention by limitations which are not contained in the claims.

Applicants' arguments/amendments are also addressed in the modified rejection above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadine Norton whose telephone number is 703-305-2667. The examiner can normally be reached on Monday through Thursday from 8:30 am to 7:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0661.

N.N.

March 10, 2003

**NADINE G. NORTON**  
**PRIMARY EXAMINER**

*Nadine Norton*